miners of the University of London, generally in conjunction with Sir J. D. Hooker and the late Dr. Thomson; and he acted also in the same capacity for the University of Cambridge and the Apothecaries' Company.

From the commencement of the *Gardener's Chronicle*, in 1841, till his health failed, he was a regular contributor to its pages. His most important papers were a series of articles on vegetable pathology, commenced in 1854 and continued at intervals till 1857. He also contributed a series of articles on the diseases of plants to the "Cyclopædia of Agriculture." He was one of the first to lay special stress upon the need for studying the full life-history of a fungus in order to understand it properly, the carrying out of which in the last generation has so completely changed many of our old ideas.

After the death of Lindley he acted for many years as botanical referee and general counsellor to the Royal Horticultural Society, a post for which he was well fitted, from his thorough knowledge of vegetable physiology and his acquaintance with practical gardening. It was in the Journal of this Society that his papers on the potato disease appeared. He was an excellent classical scholar, and read through all the proof-sheets of Bentham and Hooker's "Genera Plantarum," specially as linguistic critic. He was a man full of geniality, always willing to impart freely his wide store of information, and will be greatly missed by those that had the pleasure of his personal acquaintance. He had a commanding presence and a robust physique. His portrait, painted in oil by Peel in 1878, now hangs in the rooms of the Linnean Society, and a capital full-page engraving, by Mr. Worthington Smith, has twice appeared in the *Gardener's Chronicle*. J. G. B.

NOTES.

WE mentioned last week the *fêtes* in connection with the opening of the new Sorbonne, to which students from all the Universities of Europe had been invited. The following is a complete programme of the ten days' festivities—held under the auspices of the Association Génerale des Étudiants de Paris—in which all the students of Paris, as well as their foreign guests, were invited to take part:—August 4, gala performance at the Opera. August 5, inauguration of the Sorbonne; reception by M. Fallières, Minister of Public Instruction. August 8, reception by the Municipality of Paris at the Hôtel de Ville. August 9, *matinée* at the Comédie Française; reception by M. Yves Guyot, Minister of Public Works; reception of the English and American students by M. Beljame, Professor of English at the Sorbonne. August 10, speeches by the chiefs of the foreign delegations; performance at the Gaîté Theatre. August 11, presentation of the chiefs of the foreign delegations to M. Carnot. August 12, ascent of the Eiffel Tower; excursion to Meudon; banquet on the terrace, under the presidency of M. Janssen. The *fêtes* have been throughout a magnificent success, and the students of all countries must carry away with them the most pleasant of remembrances of their French comrades. The Government and the City of Paris had voted a sum of about £3500 to the Association Génerale des Étudiants, and it is to the organizing powers of the President, M. Chaumeton, and his devoted lieutenants, that the success of the meeting is due. At the Meudon banquet, at which there were nearly 2000 covers, M. Lavisse, Professor of Modern History at the Sorbonne, in an eloquent speech, declared that the principle of the future must be, not cosmopolitanism, but "*le respect de chaque patrie par toutes les patries.*"

THE Congress of Physiological Psychology was held in Paris last week, and the meeting is considered to have been very successful. It was decided that a second meeting should be held in 1892, either in London or in Cambridge, during the month of August.

THE Hygiene Congress at Paris brought its labours to a close on Saturday last. Among the subjects discussed during the week was that of the pollution of rivers. The Congress decided that the pollution of underground watercourses and of rivers by the residue of factories should in principle be forbidden, and that water from factories should not flow into a stream till it had been proved to be absolutely free from all injurious substances. The Congress was strongly of opinion that the most perfect method of purification was by irrigation. This, of course, must, in certain cases, be preceded by such mechanical and chemical processes as would render the water fit for agricultural purposes. It was related that many manufacturers had benefited by the application of the law, as in their efforts to prevent the pollution of watercourses they had made discoveries enabling them to utilize waste products. The difficulty was with the smaller manufacturers, who were not rich enough to take the necessary measures. The Congress decided that where persistent resistance was displayed the authorities should themselves execute the works prescribed for the purification of the water and compel the persons interested to pay the cost.

ARRANGEMENTS are being made by the local committee of the American Association at Toronto for an excursion, starting September 3 or 4, to the Huronian district. Particulars will be given in a circular, which is to be issued by the American Geological Society. There will also be an excursion to the Pacific Coast.

SOME time ago the Berlin Academy of Sciences received from Count Loubat, of New York, about £1150, with a request that a prize might be founded for the encouragement of North American studies. At the same time he sent £120, which was to be offered as a special prize. It has now been decided that a prize of £150 shall be awarded in July 1891, to the author of the best printed work on the settlement of civilized colonies in North America and their later history. The works to be submitted must have appeared between July 1, 1884, and July 1, 1889; and the authors must communicate to the Berlin Academy before July 1, 1890, their intention to compete. The language of the books may be German, English, French, or Dutch. In 1896 there will be another prize of similar amount for a work on the North American aborigines. Every five years a prize of £150 will be offered, the subjects being aboriginal and civilized history, chosen alternately. The money for the first of this series of prizes will be obtained by the addition of the special sum of £120 to the interest on the larger and permanent fund.

THE Royal Danish Academy of Sciences invites research on the following among other subjects:—Compounds of alcohol radicals with copper, silver, or gold, and compounds of polyvalent alcohol radicals with metals (all unknown at present). Prize a gold medal. The fatty acids in the fat of butter; to be isolated and determined, and relations indicated especially between the quantities of oleic acid and those of palmitic acid and their higher homologues. Prize about £32. The Mycorhizæ of the beech. Are they different in different kinds of humus? Does the structure of the mycelium give a basis for classification? Is there a reciprocal symbiosis, the fungus preparing food for the plant, &c., &c. Prize about £32. Memoirs to be sent to Prof. Zeuthen, of Copenhagen, before October 31, 1890, except in the last case, for which the date is October 31, 1891.

THE twelfth annual meeting of the Midland Union of Natural History Societies will be held at Oxford on the afternoon of Monday, September 23. An inaugural address, on heredity, will be delivered by the President, Mr. E. B. Poulton, F.R.S. This will be followed by a discussion, after which the meeting will transact all necessary business. In the evening there will be a *conversazione* in the Museum, and the Oxfordshire

Natural History Society and Field Club has arranged for exhibitions of objects of great interest. On the following day members will drive to Shotover Hill, and a lecture will be delivered by the President on "the geology of the district." Afterwards there will be a lunch in Christ Church dining hall. Special arrangements will be made for members to visit, on this and also on Monday afternoon, the following places:—Museum, Ashmolean Museum, Radcliffe Observatory, Botanic Gardens, Bodleian Library, and Clarendon Printing Press. The Oxford Society cordially invites members of natural history societies, and their friends, to the meetings of the Union; and no doubt so pleasant a programme will attract a very large number of visitors. Further information may be obtained from the Secretary, Mr. H. M. J. Underhill, 7 High Street, Oxford.

A USEFUL little volume relating to the approaching meeting of the British Association has been issued at Newcastle. It contains, in addition to the programme and other information, memoirs (reprinted from the *Newcastle Daily Chronicle*) of the President, the Presidents of Sections, and the lecturers. The volume costs threepence, and will, of course, be widely circulated. There has also been issued, for the use of those who propose to attend the meeting, a list of the hotels, apartments, and furnished houses, with a plan of Newcastle.

MR. GEORGE PHILLIPS BEVAN, F.G.S., died on the 3rd inst. at Yaldhurst, Lymington, in his sixtieth year. He was the author of many popular hand-books and guide-books. He also wrote industrial geographies of Great Britain, France, and the United States, and edited a series of works on "British Manufacturing Industries."

THE American *Botanical Gazette* announces the death of Mrs. Lydia S. Bennett, a well-known botanist at Fisk University, Tennessee.

ON August 12, about 3 o'clock a.m., a rather severe shock of earthquake was felt at Poitiers. Clocks were stopped, and furniture was displaced. No one was injured.

THE German edition of the Report of the International Meteorological Committee meeting at Zürich, in September last, contains a preface by Dr. Neumayer, relating to the development of meteorological research in Germany, which, prior to the Congress of Vienna (1873), was almost at a standstill, very little attention having been paid to what was passing in other countries. But the impulse given by that Congress and various meetings of the Committee, together with the establishment of the Deutsche Seewarte at Hamburg and the Meteorological Institute at Berlin, have made the German-speaking countries rank among the foremost and most active promoters of meteorology, all now working together on one uniform plan. The Report contains also a very useful index to all the German editions of the publications of the International Meteorological Committee since the Congress of Rome (1879). A mere glance at this index shows the generality and usefulness of the labours of the Committee, exclusive of the meetings in some way connected with it, among which may be specially mentioned those of the Polar Committee (Hamburg, 1879), and the Conference for Agricultural Meteorology (Vienna, 1880). The preparation of meteorological bibliographies, the establishment of stations in remote parts of the world and upon high mountains, the preparation of elaborate meteorological conversion tables (not yet published) for use in all countries, and uniformity of methods, are but a few of the principal results arrived at in the last sixteen years.

ONE of the latest novelties in the application of electricity consists of an electric reading-lamp, which is being fitted to the carriages on the main line of the South-Eastern Railway. It is on the principle of the "put a penny in the slot" automatic machines. The apparatus is situated immediately over the passenger's head, and under the rack, and is contained in a small box 5 inches by 3. The light is of five-candle power, and is obtained by the introduction of a penny at the top of the box, and by a subsequent pressure of a knob, and will last for half an hour, extinguishing itself at the end of that time automatically. If the light be required for an indefinite period, a penny every half an hour will suffice. The light can be extinguished at any moment by means of a second button provided for the purpose. One of the special features of the invention is that, if the instrument is out of order, the penny is not lost, as it is in the present machines. It drops right through, and comes out at the bottom of the box, so that it can be recovered, and the same result happens in the case of any coin other than a penny. Each carriage is fitted with an accumulator which supplies the electricity. This invention will add greatly to the comfort of passengers during night journeys.

SOME new light on the subject of indirect vision (*i.e.* vision with the lateral parts of the retina), is thrown by recent experiments made by Kirschmann. The common idea, that the sensitiveness of the retina diminishes outwards to the periphery, appears to be incorrect. There is an objective diminution of light-action, when a source of light is moved away laterally from the middle of the field of vision; for the mass of penetrating light gets less. Hence, were the diminishing sensitiveness a fact, a luminous surface should seem to lose brightness when moved to the side; but it does not (though it appears less distinct in outline and modified in colour). Kirschmann placed two rotatory disks made up of moveable black and white sectors (giving any degree of brightness), before the observer; who shut one eye, and looked at the middle of one disk, about a metre and a half from him, while he gave his attention to comparing the brightness of the second disk, seen at different angles, by indirect vision. The figures from numerous experiments prove that, in the horizontal meridian, the sensibility to brightness has a maximum at 22° to 25° from the centre, while in the vertical direction the maximum is at 12° to 15°. The growth of sensibility is much greater in the horizontal than in the vertical direction, and the upper part of the retina is superior in this respect to the lower. This corresponds to the needs of vision. Indirect vision with lateral parts of the retina is more important than that with the upper and lower regions; and the upper half is more important than the lower.

MESSRS. MACMILLAN have issued a new volume of the "Nature Series"—"Timber and some of its Diseases," by H. Marshall Ward, F.R.S. Until the author's articles appeared in this journal, the subject, as he says in his preface, was almost unknown in England.

A SUGGESTIVE paper, on "The Ta Ki, the Svastika, and the Cross in America," by Dr. Daniel G. Brinton, is printed in the new number of the Proceedings of the American Philosophical Society. He holds that all these symbols are graphic representations of the movements of the sun with reference to the figure of the earth, as understood by primitive man everywhere, and hence that these symbols are found in various parts of the globe without necessarily implying any historic connections of the peoples using them.

THE Geological and Natural History Survey of Minnesota has issued its sixteenth Annual Report, dealing with such results of its work as are capable of being put into a shape fit for publication. Mr. Winchell, State Geologist, says in an introductory statement that investigations are being carried forward in the lithology of the crystalline rocks and in the palæontology of the fossiliferous ores, which are not yet sufficiently far advanced to be dealt with in a Report.

IN a valuable paper, included in the Annual Report of the United States Department of Agriculture for 1888, on the plum

Curculio, Messrs. C. V. Riley and L. O. Howard state that this insect has brought about an almost entire abandonment of plum culture in many parts of America within the last twenty years; but it is by no means confined to this fruit. It breeds in great numbers in cherries, peaches, apricots, nectarines, and other stone fruits, including the Persimmon, and also infests many varieties of apples, crabs, and haws. It prefers, however, smooth-skined fruits. It is also a common inhabitant of the fungus growth of plum and cherry known as "Black Knot" (*Plowrightia morbosa*), from which it was first reared by Peck in 1818. Under the headings, "Habits and Natural History," "Natural Enemies," and "Remedies," the authors of the paper (which has just been reissued separately) give full information as to the pest to which they have devoted so much attention.

THE "Catalogue of the Moths of India," on which the compilers, Colonel C. Swinhoe and Mr. E. C. Cotes, have been engaged for three years, is completed; and an elaborate index has now been published. The compilers claim that the "Catalogue" comprises all the known moths of the Indian region, including Burma and Ceylon.

THE *Madras Journal of Literature and Science*, for the session 1888–89, contains, besides various other papers, the second part of an elaborate treatise, by Gustav Oppert, on the original inhabitants of India. In the first he treated of the Dravidians; here he deals with the other aboriginal tribes, whom he classes together under the name of the Gaudians. In the third part he proposes to set forth various conclusions to be drawn from this inquiry, supported by as much trustworthy evidence as he may be able to collect.

THE University Correspondence College, Cambridge, has sent us a copy of its latest "Matriculation Directory." The volume is full of information that will be useful to persons who propose to pass the matriculation examination of the London University. In the parts relating to text-books, much excellent advice is offered to candidates.

THE Mason Science College, Birmingham, has issued its syllabus of day classes for the session 1889–90.

THE Agricultural Society of the Gironde, as quoted in a recent British Consular Report, has published a statement showing the average costs incurred last year by proprietors in this department in employing the best-known remedies, viz. (1) against the *Phylloxera*, sulphuretted carbon; (2) against mildew, the so-called *Bouillie Bordelaise*, a mixture of three pounds of sulphate of copper with one pound of slaked lime and twenty-two gallons of water; (3) against *Oïdium*, sulphur; and (4) against *Antrachnosis*, a mixture of eighty pounds of sulphate of iron and ten pounds of sulphate of copper. The total cost of using all these remedies is said to have amounted on an average to about 31*s*. per acre, an expense which cannot be called excessive, especially when it is added that their application served at the same time as a preventive against snails and slugs, which also often do much damage to vines.

Globus contains an abstract of a paper read lately before the German Scientific Association of Santiago, on the inhabitants of Tierra del Fuego, by the Rev. C. Aspinall, an English missionary who has laboured long among them. The particular tribe amongst which the Ooshonia mission was established has received from Mr. Bridges the name of Jahgan, from a place to the south of Beagle Channel frequented by the tribe. The people usually go naked, save for a small skin thrown over the shoulders, but they smear their bodies with a mixture of train-oil and red earth as a protection against the cold. They support themselves by hunting, and at the worst feed on shell-fish. Certain disorders of the digestion, arising from the latter, they cure by a fungus diet. For the most part they move about from place to place, without any fixed abode, in bark canoes, in the centre of which a fire always burns. Each canoe contains a family, the wife rowing while the husband is always on the watch with his javelin. He always carries three kinds of spears with him, one for birds, the second for fish, and the third for crabs. On landing, the woman has first of all to carry her husband ashore, he holding the fire carefully above water, and then she begins the erection of their primitive hut. The men are rarely able to swim, but the women invariably, and this, together with their constant work at rowing, gives them extraordinary muscular power. To maintain their position as lords of creation the men have recourse to mysterious rites, from which the women are excluded. The men have usually two wives, an older and a younger one. Without writing of any kind, they yet preserve many rules and customs, mainly relating to the chase. They are good-natured and helpful, not addicted to lying or theft, but tenacious in the defence of their rights. They have many amiable traits of character. They love long stories and conversations, and in these a good part of their time is spent. One of their tales, of an extraordinary strong man who was made of stone, and ultimately was killed by a thorn entering a vulnerable spot in his heel, recalls the story of Achilles. Devoid of all religious ideas and duties, they have a vague idea of the spirits of the departed wandering about in the world, and greatly to be feared.

THE additions to the Zoological Society's Gardens during the past week include a Gazelle (*Gazella dorcas* ♂) from Egypt, presented by Mr. Umberto Arbib; a Cinereous Vulture (*Vultur monachus*) from Central Spain, presented by Lord Lilford; two Vinaceous Turtle Doves (*Turtur vinaceus*) from West Africa, presented by Mrs. Ffoulkes; two Alligators (*Alligator mississippiensis*) from Florida, presented by Mr. J. W. Bannehr; twenty-two Gold Fish (*Carassius auratus*), four Carp (*Cyprinus carpio*), British fresh waters, presented by Mr. A. H. Hastie; a Cinereous Vulture (*Vultur monachus*) from Central Spain, a Grey Parrot (*Psittacus erithacus*) from West Africa, twenty-four Teydean Chaffinches (*Fringilla teydea*) from the Canary Islands, deposited; a Globose Curassow (*Crax globicera*), two Triangular Spotted Pigeons (*Columba guinea*), two Cambayan Turtle Doves (*Turtur senegalensis*), bred in the Gardens.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 *AUGUST* 18–24.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on August 18

Sun rises, 4h. 52m.; souths, 12h. 3m. 35·1s.; daily decrease of southing, 13·3s.; sets, 19h. 15m.: right asc. on meridian, 9h. 51·8m.; decl. 12° 58′ N. Sidereal Time at Sunset, 17h. 4m.

Moon (at Last Quarter August 18, 11h.) rises, 22h. 18m.*; souths, 5h. 39m.; sets, 13h. 13m.: right asc. on meridian, 3h. 26·4m.; decl. 14° 48′ N.

Planet.	Rises.	Souths.	Sets.	Right asc. and declination on meridian.	
	h. m.	h. m.	h. m.	h. m.	° ′
Mercury..	5 48	12 46	19 44	10 34·0	10 33 N.
Venus.....	1 10	9 11	17 12	6 58·5	21 9 N.
Mars......	3 2	10 52	18 42	8 39·9	19 31 N.
Jupiter....	16 11	20 4	23 57	17 53·5	23 25 S.
Saturn....	4 38	11 59	19 20	9 47·1	14 36 N.
Uranus...	9 55	15 23	20 51	13 11·4	6 56 S.
Neptune..	22 34*	6 24	14 14	4 11·2	19 26 N.

* Indicates that the rising is that of the preceding evening.

Aug.	h.	
22	22	Venus in conjunction with and 1° 59′ south of the Moon.
24	18	Mars in conjunction with and 1° 29′ south of the Moon.